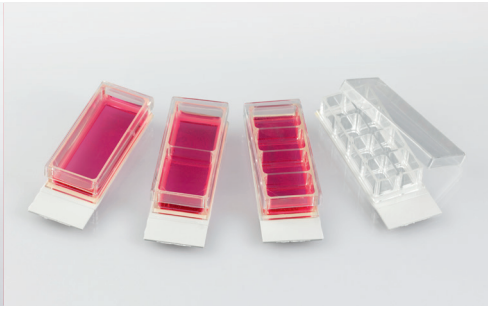
lumox® Reference Guide

Which options do I have for the cultivation of my cells?



Come Grow with us

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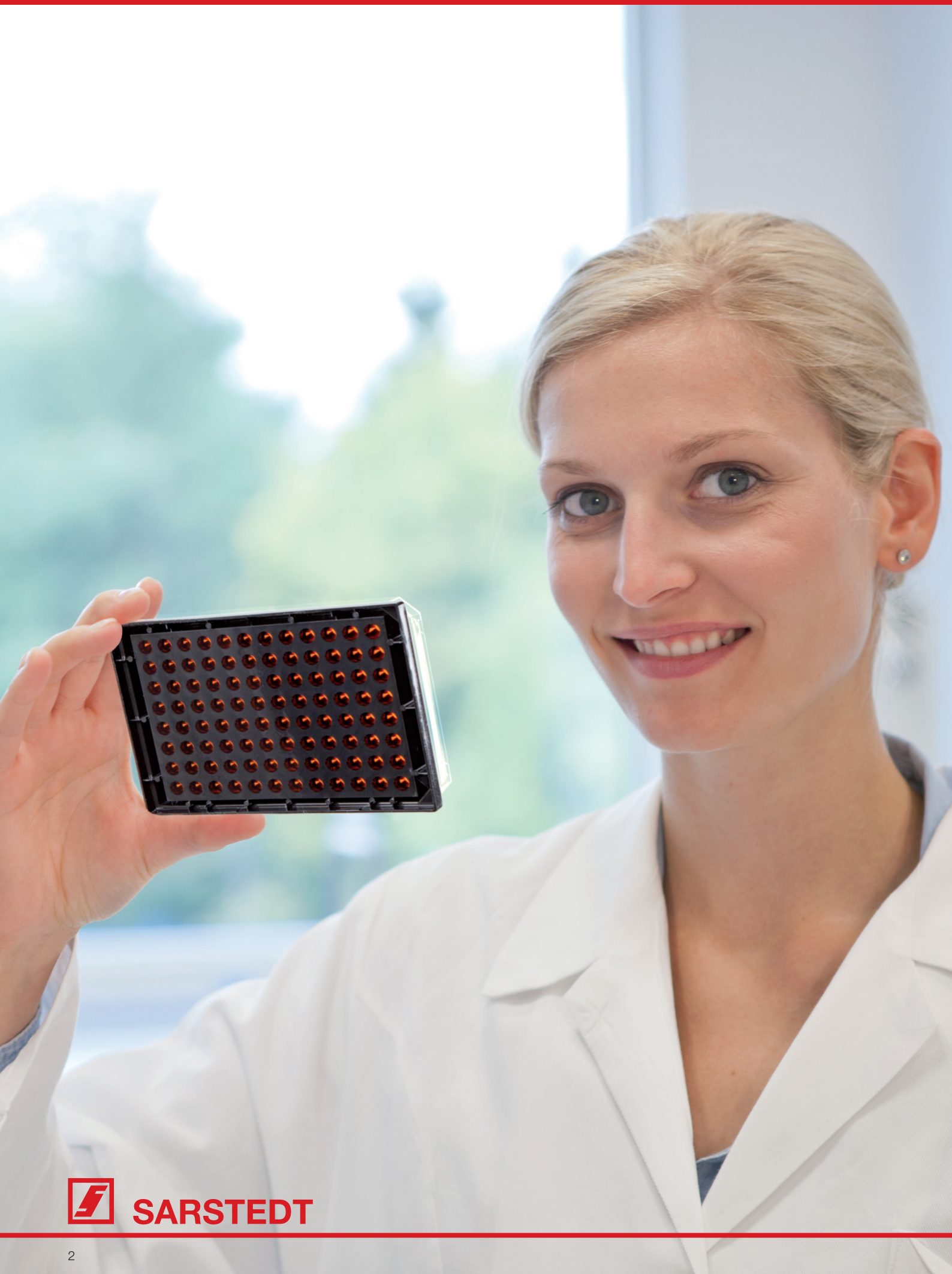

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Are you planning to add a new cell line to your cell culture?

Or do you want to establish a new analysis method?

No matter how different your cells and your analysis methods are – your demand for specialised products might just be as individual. Our range of products equipped with a lumox® film base includes dishes, multiwell plates and slide-based x-well cell culture chambers. For easy selection of the appropriate product, the following pages provide an overview of cells and organisms that have already been successfully cultivated on the lumox® products as well as the intended application or analysis performed afterwards.

This reference guide is intended to support you in selecting the ideal product for your cells and application. In view of the multitude of factors that have an impact on the cultivation of cells, tissues and organisms, we recommend to always test the products under your specific conditions.

Has your cell, organism or application not been listed yet but you have already tested the lumox® products? We are always interested in extending our reference guide. Share your experience with us!

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lumox® products

lumox® cell culture products are characterised by their ultra-thin, gas-permeable film base. Optimum gas exchange is guaranteed due to the gas permeability and the short diffusion paths. The lumox® film base features very low autofluorescence and excellent light transmission, making the products highly suitable for microscopical and reader imaging techniques. For further analyses, like e.g. electron microscopy or mass spectrometry, the lumox® film base can be swiftly excised using a scalpel and is highly resistant against various chemicals needed.

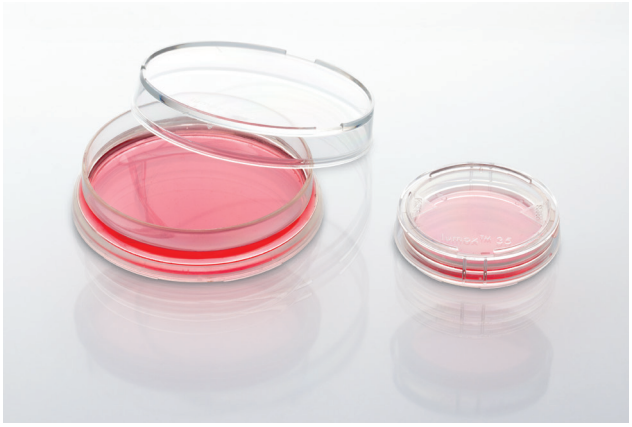
The following products are equipped with a lumox® film bottom:

lumox® dish

lumox® dish is made of a transparent polystyrene cover and a polystyrene frame with the base made of the transparent, gas-permeable and ultra-thin (25 µm) lumox® film. lumox® dish is available with a diameter of 35 mm and 50 mm.

Additionally, the lumox® dish is available with two different growth surfaces:

- red = the hydrophilic surface provides an ideal culture substrate for many adherent cells
- green = the hydrophobic growth surface is ideally suited for suspension cells (usually cells of lymphoid origin, hybridoma cells etc.) which are cultured non adherently in solution



lumox® multiwell

lumox® multiwell plates consist of a black polystyrene frame with a base made of the transparent, gas-permeable and ultra-thin (50 µm) lumox® film. The external dimensions of these plates are in accordance with ANSI/SLAS standard 1-2004: Microplates – Footprint Dimensions and can be used for analyses in instruments requiring these standard dimensions. lumox® multiwell plates are available in 24-well, 96-well and 384-well format with the following surface:

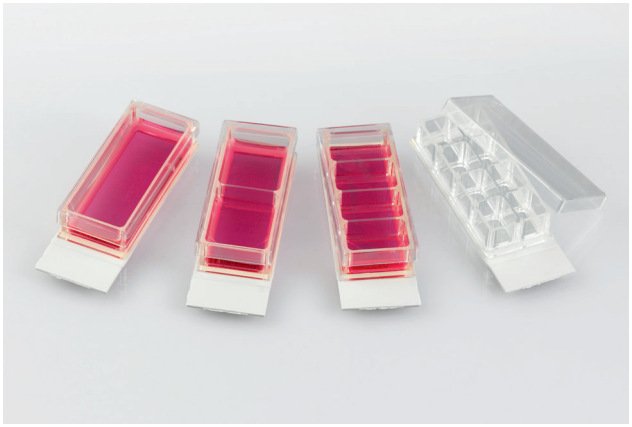
- red = the hydrophilic surface provides an ideal culture substrate for many adherent cells

x-well lumox® detachable

The x-well cell culture system allows cultivation and analysis of cells on a microscope slide. x-well lumox® detachable consists of a polystyrene lid and frame attached to a slide. The slide itself is comprised of the transparent, gas-permeable and ultra-thin lumox® film attached to a white frame. This frame provides stability for handling the products and offers a writing area for labeling the samples. x-well lumox® detachable are available in 1-well, 2-well, 4-well and 8-well formats with the following surface:

- red = the hydrophilic surface provides an ideal culture substrate for many adherent cells

For further processing, the chamber can be detached from the slide without a tool by lifting the chamber slightly. Furthermore, no residual adhesive will be left on the slide so that further steps can be carried out swiftly.



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Cell type/tissue/organism	Description	Product
Amniotic cells	Human primary	x-well lumox®
AsPC-1	Pancreatic Cancer cell line	lumox® dish
Bacillus aquimaris	Rirmicutes bacteria	lumox® film
Bacillus subtilis	Rirmicutes bacteria	lumox® film
bEnd.3	Murine brain endothelial cell line	x-well lumox®
BT-20	Human mammary cancer cell line	lumox® multiwell
Blastocytes	Murine Blastocytes	lumox® dish
Border Cells	Drosophila egg chamber cells	lumox® dish 50 (94.6077.410)
Brain slices	Murine brain slices E12.5	lumox® dish
CaCO2	Human epithelial colon adenocarcinoma cell line	lumox® multiwell
Cardiac cells	Primary, human, cardiac origin	x-well lumox®
Chorion cells	Human primary	x-well lumox®
CM	Murine cardiale myocyten	x-well lumox®
Cortical organoids	Human PSC derived	lumox® dish
COS-7	Chinese hamster ovarien cell line	lumox® multiwell 24
Drosophila midgut	Adult, disected midgut	lumox® dish 35 (94.6077.331)
Drosophila Embryo	Whole fly embryo	lumox® dish
Drosophila Embryo	Whole fly embryo	lumox® dish
Drosophila Embryo	Whole fly embryo	lumox® film
Drosophila Embryo	Whole fly embryo	lumox® dish
Drosophila Embryo	Whole fly embryo	lumox® dish
Drosophila Embryo	Whole fly embryo	lumox® dish
E.coli	Wild-type E. coli strain K-12	lumox® dish (94.6077.333)
E.coli BL-21 (De3)	Bacteria	lumox® multiwell
Endothelial cells	Human primary, vein	x-well lumox®
ESC	Human embryonic stem cells	lumox® multiwell 24
ESC	Murine embryonic stem cell line	x-well lumox® detachable
ESC (line CCE)	Murine embryonic stem cells	lumox® multiwell
Eyelid Culture	Primary murine eyelid culture	lumox® dish
H9-Dll1 cells	Human embryonic stem cell line H9-Dll1	lumox® multiwell
HAM	Human amnion membrane	lumox® dish 35
HEK	Human embryonic kidney cell line	lumox® multiwell 96
HEK-293T	Human embryonic kidney cell line - Large T-Antigen	lumox® multiwell 96
HEK-293T	Human embryonic kidney cell line - Large T-Antigen	lumox® multiwell 96
HEK-293T	Human embryonic kidney cell line - Large T-Antigen	lumox® multiwell 96
HeLa	Human cervix carcinoma cell line	x-well lumox®
HeLa	Human cervix carcinoma cell line	x-well lumox®
Hemocytes	Drosophila immune cells	lumox® dish
Hepatocytes	Primary, human	x-well lumox®
Hepatocytes	Primary, rat	lumox® multiwell 24
Hepatocytes	Primary, rat	lumox® dish
HepG2	Human hepatocyte carcinoma cell line	lumox® dish 35
hiPSC-RPE cell sheets	Retina pigment epithelium cell sheets derived from human induced pluripotent stem cells	lumox® dish 35
HuH7.5	Human hepatocarcinoma cell line	lumox® multiwell 24

Analysis / application	Literature / Source
Fluorescent microscopy	Grebenstein, B. et al., Application Note
Confocal microscopy	Broughton, L. 2016, Dissertation
Biofilm culture	Lachnit, T. et al., FEMS Microbiol Ecol 84 (2013) 411-420
Biofilm culture	Lachnit, T. et al., FEMS Microbiol Ecol 84 (2013) 411-420
Fluorescent microscopy	Loserth, S., Application Note
GC-MS, LC/MS-MS	Beatty, A. et al. 2017, DOI: 10.1158/1535-7163.MCT-17-0407
Spinning disk confocal microscopy	Customer information / SARSTEDT in-house test
Live cell imaging	Customer information / SARSTEDT in-house test
Live cell imaging	Panoudopuolou, E., Green J., PLOS Biology | DOI:10.1371/journal.pbio.1002405 March 9, 2016
Fluorescent microscopy	Welk, M. et al., SARSTEDT Application Note
Bright field microscopy	Haag, M., SARSTEDT Application Note
Fluorescent microscopy	Grebenstein, B. et al., SARSTEDT Application Note
Microscopy for planimetric measurement	Straubinger, J. et al., 2017, FASEB Journal Vol. 31, No. 4, pp. 1620-1638
Cultivation	Watanabe, M. et al. 2017, doi.org/10.1016/j.celrep.2017.09.047
Fluorescent laser-scanning microscopy	Ujike, M. et al., Journal of General Virology (2016), 97, 1853–1864
Live cell imaging	He, L. et al. 2018, Nature. 2018 March 01; 555(7694): 103–106. doi:10.1038/nature25744
Microscopy	Evans I.R. et al., JoVE Journal of Visualized Experiments 2010, 36, http://www.jove.com/index/Details.stp?ID=1696, doi: 10.3791/1696
Live imaging	Deutschman, E. et al. 2018, doi: https://doi.org/10.1534/genetics.118.301344
Live imaging	Garcia, H and Gregor, T. 2018, RNA Detection: Methods and Protocols, Methods in Molecular Biology, vol. 1649, DOI 10.1007/978-1-4939-7213-5_23
Confocal microscopy	van den Brink DM, et al., PLoS ONE 2013, 8(5): e64427
Confocal microscopy	Zanet, J. et al., J. Cell Biol., 2012, Vol. 197 No. 4 477–486
Widefield and confocal microscopy	Matsubayashi, Y. et al., Current Biology 27, 3526–3534.e1–e4, 2017
Time-lapse fluorescence imaging	Morris, R. et al., New J. Phys. 19 (2017) 035002
Fluorescent imaging	Customer information / SARSTEDT in-house test
Fluorescent microscopy	Puschmann, C., SARSTEDT Application Note
Confocal microscopy	Bone, H. et al., Journal of Cell Science 2011, Vol. 124, 1992-200
Fluorescent microscopy	Ripoll, Y., Dissertation,"Glycogen Synthase Kinase 3 (GSK-3) involvement in regulation of mouse embryonic stem cell fate", University of Bath Department of Pharmacy and Pharmacology, 2011
Fluorescent microscopy	Customer information / SARSTEDT in-house test
Live Imaging	Heller, E. et al., Dev. Cell 28, 617–632, 2014,
Confocal Microscopy	Pallocca, G. et al., Arch Toxicol (2017) 91:3385–3402
Confocal Laser Scanning Microscopy	Customer information / SARSTEDT in-house test
Fluorescent plate reading	Customer information / SARSTEDT in-house test
Live cell imaging	Ishii, S. et al., Biosci. Biotechnol. Biochem. 2011, 76 (3), 523-529
Live cell imaging	Masuda, K. et al., PLoS ONE 2012, 7(4): e35380
Live cell imaging	Sakurai, T. et al., Biochemical and Biophysical Research Communications 402 (2010) 595–601
Fluorescent microscopy	Dehne, H.-J., SARSTEDT Application Note
Electron microscopy	Taylor, R. et al. 2018, doi: http://dx.doi.org/10.1101/401133
Live imaging	Evans et al. 2010, doi: 10.3791/1696
Bright field microscopy	Ullrich, A. et al., SARSTEDT Application Note
Cultivation	Matsui, H. et al., Biological Engineering Journal, 52/2-3, pp 255-262, 2010
Fluorescent microsocpy	Matsui, H. et al., The Royal Society of Chemistry, Lab Chip, 2012, 12, 1857-1864
GC-MS, LC/MS-MS	Ramirez, T. et al., Arch Toxicol (2018), DOI 10.1007/s00204-017-2079-6
Laser microdissection	Customer information / SARSTEDT in-house test
Electron microscopy	Jiang, B. et al. 2015, J. Virol. doi:10.1128/JVI.03109-15

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Cell type/tissue/organism	Description	Product
HUVEC	Human umbilical vein endothelial cells	lumox® film
HUVEC	Human umbilical vein endothelial cells	lumox® dish 35 (94.6077.331)
HUVEC/B16F10 3D co-culture	3D co-culture of Human umbilical vein endothelial cells and B16F10 murine melanoma cell line	lumox® dish 35 (94.6077.331)
hvEC	Human endothelial cells	x-well lumox®
IPEC-1	Intestinal porcine epithelial cells	lumox® dish
IPEC-J2	Intestinal porcine epithelial cells	lumox® dish
IPEC-J2	Intestinal porcine epithelial cells	lumox® multiwell 96
iPS	Induced pluripotent stem cells	lumox® multiwell 24
iPS	Human induced pluripotent stem cells	lumox® multiwell 24
iPS derived cortical tissue	Human induced pluripotent stem cell derived cortical tissue	lumox® dish
Jimt-1	Human breast cancer	lumox® multiwell 96
KRIB	v-Ki-ras transformed human osteosarcoma cells	lumox® dish 50
L929	Mouse fibroblast cell line	lumox® multiwell 96
LM8	Mouse osteosarcoma cells	lumox® dish 35
Lotus japonicus	Transformed root	lumox® film
M2 macrophages	Human monocyte derived macrophages	lumox® dish hydrobic
Macrophage	Human, primary	lumox® dish
Macrophage	Murine bone marrow derived macrophage, primary	lumox® multiwell
MCF10A	Human breast cell line	lumox® multiwell
MDA-MB-231	Human mammary adenocarcinoma	lumox® multiwell
MDA-MB-231	Human mammary adenocarcinoma	lumox® dish 35 (94.6077.331)
MDM	Human monocyte-derived macrophages	lumox® dish
Medicago truncatula	Transgenic root explant	lumox® film
MEF	Murine embryonic fibroblasts	4-well lumox® detachable
MEF	Mouse embryo fibroblast cells transfected with Oct-4-GFP	4-well lumox® detachable
MH-S	Murine alveolar macrophages	lumox® multiwell 24
mESC line	Murine embryonic stem cell line 129/SVEV feeder-dependent	lumox® multiwell 24
miPSC-RPE cell sheets	Retina pigment epithelium cell sheets derived from monkey induced pluripotent stem cells	lumox® dish 35
Monocytes/Macrophages	Human, primary	lumox® dish hydrobic
Monocytes/Macrophages	Human, primary	lumox® dish
Monocytes	Human, primary	lumox® film
MSC	Primary muscle derived cells	lumox® dish
N2a	Murine neuroblastoma cell line	lumox® multiwell 24
Neuroblastoma	Human neuroblastoma cells	lumox® multiwell 24
Neuronal hippocampal culture	Rat, primary	lumox® multiwell 24
NIH3T3	Murine embryonic fibroblast cell line	lumox® dish 35
NK Cells	Natural Killer, primary human	lumox® dish 94.6077.305
PBMC	Peripheral blood mononuclear cells	lumox® dish
PC	Drosophilar polar cells	lumox® dish 94.6077.410
PC12	Rat pheochromocytoma cell line	x-well lumox®
pFB	Primary bovine fibroblasts	lumox® dish 35
PIXV	Pixuna Virus	lumox® dish 50 (94.6077.410)

Analysis / application	Literature / Source
Fluorescent microsocpy	Menzel, S. et al., Hindawi, BioMed Research International, Volume 2017, Article ID 5258196, 8 pages, https://doi.org/10.1155/2017/5258196
Phase microscopy	Customer information / SARSTEDT in-house test
Time-lapse microsopy	Yamamoto S. et al., PLOS ONE 2014, Vol. 9 Issue 7, doi:10.1371/journal.pone.0103502
Fluorescent microscopy	Puschmann, C., Application Note
Fluorescence and electron Microscopy	Nossol, C. et al., Histochem Cell Biol (2011) 136:103–115, DOI 10.1007/s00418-011-0826-y
Fluorescence and electron Microscopy	Nossol, C. et al., Histochem Cell Biol (2011) 136:103–115, DOI 10.1007/s00418-011-0826-y
Confocal microscopy	Kern, M. et al., Hindawi, Mediators of Inflammation, Volume 2017, Article ID 2748192, 13 pages
Confocal microscopy	Cristo F. et al., Stem Cell Research 25 (2017) 152–156
Fluorescent microsocpy	Freyer, N. et al., Int. J. Mol. Sci. 2017, 18, 1724
Cultivation	Eguchi, N. et al., Biochemical and Biophysical Research Communications 498 (2018) 729e735
Time-Lapse Recording Using Digital Holographic Microscopy	Janicke, B. et al., Cytometry Part A 91A: 460469, 2017
Real time phase contrast	Sun, Z. et al. 2018, Cancer Res. 2018 February 15; 78(4): 950–961. doi:10.1158/0008-5472.CAN-17-1597
Time-Lapse Recording Using Digital Holographic Microscopy	Janicke, B. et al., Cytometry Part A 91A: 460469, 2017
Flow Cytometry	Matsuo, T. et al., ONCOLOGY LETTERS 14: 3071-3076, 2017
Cultivation	Krebs M. et al., The Plant Journal (2012) 69, 181–192
Cultivation	Bayer, C. et al., J. Virol. 2013, 87(1):67. DOI: 10.1128/JVI.01585-12.
Cultivation	Grimm, V et al., AEM, 2014, Vol.80 No 9 p. 2842–2850, doi:10.1128/AEM.04261-13
Cultivation	Wiese, M. et al., Infect. Immun. 2012, 80(4):1455. DOI: 10.1128/IAI.05972-11.
GC-MS, LC/MS-MS	Beatty, A. et al. 2017, DOI: 10.1158/1535-7163.MCT-17-0407
GC-MS, LC/MS-MS	Beatty, A. et al. 2017, DOI: 10.1158/1535-7163.MCT-17-0407
Cultivation	Bordag et al., Metabolomics 2016, 6:1, doi: 10.4172/2153-0769.1000164
Cultivation	Customer information / SARSTEDT in-house test
Live Imaging	Customer information / SARSTEDT in-house test
Live cell imaging	Rolf H., et al., PLoS ONE, 2012, Vol. 7 Issue 2 e32287, doi:10.1371/journal.pone.0032287
Cultivation	Gaus, L. Inaugural-Dissertation, "Charakterisierung des Expressions- und Proliferationsverhaltens der STRO-1-positiven und -negativen Rosenstockperiostzellen des Europäischen Damhirsches (Cervus dama), Medical faculty Georg-August-University Göttingen, 2015
Fluorescent plate reading	Thywißen, A. et al., Front. Microbio. 2011, Vol. 2:96. doi: 10.3389/fmicb.2011.00096
Cultivation	Knöspe, F. 2012, Dissertation: Expansion of embryonic stem cells in 3D-bioreactors
Laser microdissection	Customer information / SARSTEDT in-house test
Cultivation	Bayer, C. et al., J. Virol. 2013, 87(1):67. DOI: 10.1128/JVI.01585-12
Cultivation	Neu C, et al., PLoS ONE 2013 8(6): e66898
Culture bags	Vogl, T., Application Note
Fluorescent microsocpy	Customer information / SARSTEDT in-house test
Confocal laser scanning microscopy	Customer information / SARSTEDT in-house test
Electron microscopy	Winkler, M. et al., SARSTEDT Application Note
Fluorescent microsocpy	Martens, M., SARSTEDT Application Note
Phase-contrast microscopy	Customer information / SARSTEDT in-house test
Cultivation	Figueiredo, A. et al., Data in Brief 14 (2017) 77–83
Cultivation	Bayer et al., J. Virol. 2013, 87(1):67. DOI: 10.1128/JVI.01585-12.
Concocal image stacks, Live Imaging	Torres, A. et al., Cell Death and Disease (2017) 8, e2814; doi:10.1038/cddis.2017.166
Fluorescent and bright field microsocpy	Wissel, K., SARSTEDT Application Note
Cultivation	Schwarting et al., PLOS ONE 2015,| DOI:10.1371/journal.pone.0116833
UV irradiation experiment	Sagripant, J. et al., Photochemistry and Photobiology, 2011, 87: 1369–1378

Cell type/tissue/organism	Description	Product
PMSC	Primary porcine muscle derived stem cells	lumox® dish 35
pOB	Primary bovine osteoblasts	lumox® dish 35
Pseudoalteromonas carrageenovora	Gammaproteobacteria	lumox® film
Pseudomonas sp.	Gammaproteobacteria	lumox® film
PtK2	Rat kidney epithelial cell line	x-well lumox®
Raji	Lymphoma cell line, human	lumox® multiwell
Retina Explant	Rat retina explant culture	lumox® dish 35
Retina Explant culture	Zebrafish retina axon explant culture	lumox® dish
Root Hair/Root epidermal cells	Arabidopsis, tubular extensions from trichoblasts	lumox® dish
ScN2a	Murine neuroblastoma cell line scrapie-infected	lumox® dish 50 (94.6077.410)
S. epidermidis	Bacteria S. epidermidis ATCC 35984	lumox® multiwell 24
Schizosaccharomyces pombe	Fission yeast strain	lumox® dish
Serum	Mouse serum	lumox® multiwell 384
SH-SY5Y	Human neuroblastoma cell line	lumox® multiwell 96
SK-MEL-5	Human melanoma cell	lumox® multiwell 96
SKX	Radiosensitive squamous cell carcinoma cell line	4-well lumox® detachable
SZ95	Human sebocyte cell line	x-well lumox®
T98G	Human glioblastoma cell line	lumox® dish 50
Tendon Culture	Bovine tendon culture	lumox® dish 35
THP1	Human monocytic macrophages	lumox® multiwell
THP-1	Human monocytic macrophages	lumox® multiwell 24
TJ356 worms	Caenorhabditis elegans	lumox® dish
Tracheal epithelium	Primary, porcine	x-well lumox®
TS cells	Tryphoblast stem cells	lumox® dish 35
U937	Human lymphoma cell line	x-well lumox®
VACV	Vaccinia Virus	lumox® dish 50 (94.6077.410)
Zooshikella sp.	Gammaproteobacteria	lumox® film

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Analysis / application	Literature / Source
Fluorescent microsocpy	Customer information / SARSTEDT in-house test
Cultivation	Schwarting et al., PLOS ONE 2015,| DOI:10.1371/journal.pone.0116833
Biofilm culture	Lachnit, T. et al., FEMS Microbiol Ecol 84 (2013) 411-420
Biofilm culture	Lachnit, T. et al., FEMS Microbiol Ecol 84 (2013) 411-420
Fluorescent microsocpy	Dehne, H.-J., SARSTEDT Application Note
Fluorescent microsocpy	Welk, M. et al., SARSTEDT Application Note
Cultivation	Liu, H. et al., IOVS, October 2017, Vol. 58, No. 12, 5130
Time-lapse imaging	Customer information / SARSTEDT in-house test
Live imaging	Zárský, V. and Cvrcková, Methods in Molecular Biology, 2014, Vol. 1080, pp 195-199
Electron microscopy	Customer information / SARSTEDT in-house test
Live and dead fluorescence microplate readings	Svensson S. et al., Intern. J. of Nanomedicine 2014:9 pp. 775-794
Cultivation	Customer information / SARSTEDT in-house test
Fluorescence intensity measurement	Patil SS, Gentschev I, Adelfinger M, Donat U, Hess M, et al. (2012), PLoS ONE 7(10): e47472
Cultivation	Taylor, J. et al., Faraday Discuss., 2017, 205, 409
Time-Lapse Recording Using Digital Holographic Microscopy	Janicke, B. et al., Cytometry Part A 91A: 460469, 2017
Fluorescent microsocpy	Kraft, S.D. et al., New Journal of Physics 12 (2010) 085003 (12pp)
Fluorescent microsocpy	Seltmann, H. et al., SARSTEDT Application Note
Real time phase contrast	Sun, Z. et al. 2018, Cancer Res. 2018 February 15; 78(4): 950–961
Cultivation	Schwarting et al., PLOS ONE 2015,| DOI:10.1371/journal.pone.0116833
Live Cell Imaging	de Morrée, A. et al., The Journal of Biological Chemistry Vol. 288, No. 20, pp. 14147–14157, 2013
Fluorescent plate reading	Thywißen, A. et al., Front. Microbio. 2011, 2:96. doi: 10.3389/fmicb.2011.00096
Live Imaging	Keshet, A. et al., Mol Genet Genomics (2017) 292:1341–1361
Bright field microscopy	van de Wal, R., SARSTEDT Application Note
Live Cell Imaging	Hesse, M. et al., Nat. Commun. 3:1076, doi: 10.1038/ncomms2089 (2012)
Fluorescent microsocpy	Wagner, D., SARSTEDT Application Note
UV irradiation experiment	Sagripanti, J. et al., Photochemistry and Photobiology, 2011, 87: 1369–1378
Biofilm culture	Lachnit, T. et al., FEMS Microbiol Ecol 84 (2013) 411-420

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If you have any questions, we'll be happy to help!

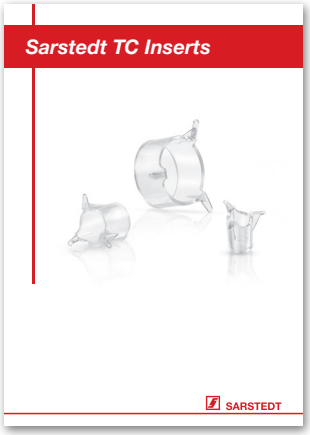
Visit our website: www.sarstedt.com

Brochure 719

Brochure 215

Brochure 783

Brochure 512



Brochure 745

Brochure 417

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